

WHAT IS CLAIMED IS:

1. A sealed actuator comprising:  
a motor stator including a stator magnetic pole excited  
by a rotation-drive coil;  
5 housings to which said motor stator is attached;  
a motor rotor including a rotor magnetic pole disposed  
opposite to a surface of said stator magnetic pole through a  
gap;  
10 bearings for rotatably supporting a rotation shaft of  
said motor rotor to said housing;  
displacement measuring means for measuring displacement  
of said motor rotor; and  
a hermetically sealing partition wall made of a  
nonmagnetic metal material and disposed at the gap between said  
15 stator magnetic pole and said rotor magnetic pole, a space  
where said motor rotor is disposed being hermetically isolated  
from a space where said motor stator is disposed;  
20 wherein said bearings are a plurality of rolling  
bearings, said rolling bearings supporting said motor rotor at  
positions on said housings at both sides of a member  
constituting said sealing partition wall in a longitudinal  
direction of said motor rotor so that said housings directly  
receive a load applied to said bearings.

25 2. A sealed actuator as claimed in claim 1, wherein  
said displacement measuring means comprises a resolver rotor  
made of a magnetic metal material, disposed at a side of said  
motor rotor, and include a salient tooth; and a resolver stator  
including a detection coil magnetic pole and disposed at a side  
of said motor stator.

30 <sup>2</sup>/<sub>3</sub>. A sealed actuator as claimed in claim <sup>1</sup>/<sub>2</sub>, wherein  
said resolver rotor is fixed to a member of a nonmagnetic

substance.

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a 4. A sealed actuator as claimed in claim 2, wherein  
said resolver ~~rotor~~<sup>stator</sup> includes a differential circuit type  
winding.

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5 5. A sealed actuator as claimed in claim 2, further  
comprising a magnetic shield plate made of a magnetic metal  
material disposed between said stator magnetic pole of said  
motor stator and said detection coil magnetic pole of said  
resolver stator.

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10 6. A sealed actuator as claimed in claim 2, wherein  
said resolver rotor is fixed to a member of a nonmagnetic  
substance; wherein said resolver rotor includes a differential  
circuit type winding; and wherein said actuator further  
15 comprises a magnetic shield plate made of a magnetic metal  
material disposed between said stator magnetic pole of said  
motor stator and said detection coil magnetic pole of said  
resolver stator.

20 7. A sealed actuator comprising:  
a motor stator including a stator magnetic pole excited  
by a rotation-drive coil;

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a housing to which said motor stator is attached;  
a motor rotor including a rotor magnetic pole disposed  
opposite to a surface of said stator magnetic pole through a  
gap;

25 bearings for rotatably supporting a rotation shaft of  
said motor rotor to said housing;

displacement measuring means for measuring displacement  
of said motor rotor; and

30 a hermetically sealing partition wall made of a  
nonmagnetic metal material and disposed at the gap between said

stator magnetic pole and said rotor magnetic pole, a space where said motor rotor is disposed being hermetically isolated from a space where said motor stator is disposed;

5 wherein said displacement measuring means comprises a resolver rotor made of a magnetic metal material, disposed at a side of said motor rotor, and including a salient tooth; and a resolver stator including a detection coil magnetic pole and disposed at a side of said motor stator.

10 8. A sealed actuator as claimed in claim <sup>6</sup>7, wherein said resolver rotor is fixed to a member of a nonmagnetic substance.

9. A sealed actuator as claimed in claim <sup>6</sup>7, wherein said resolver <sup>stator</sup>~~rotor~~ includes a differential circuit type winding.

15 10. A sealed actuator as claimed in claim 7, wherein said displacement measuring means includes a coarse resolver and a fine resolver.

20 <sup>10</sup>11. A sealed actuator as claimed in claim <sup>6</sup>7, wherein said motor stator and said <sup>motor rotor</sup>~~rotor stator~~ constitutes a variable-reluctance motor.

25 <sup>11</sup>12. A sealed actuator as claimed in claim <sup>6</sup>7, further comprising a magnetic shield plate made of a magnetic metal material disposed between said stator magnetic pole of said motor stator and said detection coil magnetic pole of said resolver stator.

<sup>12</sup>13. A sealed actuator as claimed in claim <sup>6</sup>7, wherein said resolver rotor is fixed to a member of a nonmagnetic

substance; wherein said resolver rotor includes a differential circuit type winding; and wherein said actuator further comprises a magnetic shield plate made of a magnetic metal material disposed between said stator magnetic pole of said motor stator and said detection coil magnetic pole of said resolver stator.

14. A sealed actuator comprising:

a motor stator including a stator magnetic pole excited by a rotation-drive coil;

a housing to which said motor stator is attached;

a motor rotor including a rotor magnetic pole disposed opposite to a surface of said stator magnetic pole through a gap;

bearings for rotatably supporting a rotation shaft of said motor rotor to said housing;

displacement measuring means for measuring displacement of said motor rotor; and

a hermetically sealing partition wall made of a nonmagnetic metal material and disposed at the gap between said stator magnetic pole and said rotor magnetic pole, a space where said motor rotor is disposed being hermetically isolated from a space where said motor stator is disposed;

wherein said sealed actuator further comprises reinforcing means for reinforcing at least a part of said hermetically sealing partition wall.

15. A sealed actuator as claimed in claim 14, wherein said reinforcing means is at least one selected from a group consisting of a reinforcing member and a molding agent.

16. A sealed actuator comprising a plurality of unit sealed actuators connected in series to each other, each of said unit sealed actuators comprising:

a motor stator including a stator magnetic pole excited by a rotation-drive coil;

a housing to which said motor stator is attached;

a motor rotor including a rotor magnetic pole disposed opposite to a surface of said stator magnetic pole through a gap;

bearings for rotatably supporting a rotation shaft of said motor rotor to said housing;

displacement measuring means for measuring displacement of said motor rotor; and

a hermetically sealing partition wall made of a nonmagnetic metal material and disposed at the gap between said stator magnetic pole and said rotor magnetic pole, a space where said motor rotor is disposed being hermetically isolated from a space where said motor stator is disposed;

wherein said bearings are a plurality of rolling bearings, said rolling bearings supporting said motor rotor at positions on said housings at both sides of a member constituting said sealing partition wall in a longitudinal direction of said motor rotor so that said housings directly receive a load applied to said bearings;

wherein said rotor magnetic pole includes a salient pole tooth of a steel material of a magnetic substance subjected to salient pole working; and

wherein said displacement measuring means comprises a resolver rotor made of a magnetic metal material, disposed at a side of said motor rotor, and include a salient pole tooth; and a resolver stator including a detection coil magnetic pole and disposed at a side of said motor stator.

<sup>16</sup>  
~~17~~. A sealed actuator comprising a plurality of unit sealed actuators connected in series to each other, each of said unit sealed actuators comprising:

a motor stator including a stator magnetic pole excited

by a rotation-drive coil;

housings to which said motor stator is attached;

a motor rotor including a rotor magnetic pole disposed opposite to a surface of said stator magnetic pole through a gap;

bearings for rotatably supporting a rotation shaft of said motor rotor to said housing;

displacement measuring means for measuring displacement of said motor rotor; and

a hermetically sealing partition wall made of a nonmagnetic metal material and disposed at the gap between said stator magnetic pole and said rotor magnetic pole, a space where said motor rotor is disposed being hermetically isolated from a space where said motor stator is disposed;

wherein said bearings are a plurality of rolling bearings, said rolling bearings supporting said motor rotor at positions on said housings at both sides of a member constituting said sealing partition wall in a longitudinal direction of said motor rotor so that said housings directly receive a load applied to said bearings.

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18. A sealed actuator comprising a plurality of unit sealed actuators connected in series to each other, each of said unit sealed actuators comprising:

a motor stator including a stator magnetic pole excited by a rotation-drive coil;

a housing to which said motor stator is attached;

a motor rotor including a rotor magnetic pole disposed opposite to a surface of said stator magnetic pole through a gap;

bearings for rotatably supporting a rotation shaft of said motor rotor to said housing;

displacement measuring means for measuring displacement of said motor rotor; and

a hermetically sealing partition wall made of a nonmagnetic metal material and disposed at the gap between said stator magnetic pole and said rotor magnetic pole, a space where said motor rotor is disposed being hermetically isolated from a space where said motor stator is disposed;

wherein said displacement measuring means comprises a resolver rotor made of a magnetic metal material, disposed at a side of said motor rotor, and including a salient tooth; and a resolver stator including a detection coil magnetic pole and disposed at a side of said motor stator.

18. A sealed actuator as claimed in claim 17, wherein said resolver rotor is fixed to a member of a nonmagnetic substance.

19. A sealed actuator as claimed in claim 17, wherein said resolver <sup>stator</sup>~~rotor~~ includes a differential circuit type winding.

20. A sealed actuator as claimed in claim 17, wherein said displacement measuring means includes a coarse resolver and a fine resolver.

21. A sealed actuator as claimed in claim 17, wherein said motor stator and said <sup>motor rotor</sup>~~rotor stator~~ constitutes a variable-reluctance motor.

22. A sealed actuator as claimed in claim 17, further comprising a magnetic shield plate made of a magnetic metal material disposed between said stator magnetic pole of said motor stator and said <sup>e</sup>~~detec~~tion coil magnetic pole of said resolver stator.

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24. A sealed actuator as claimed in claim <sup>17</sup>~~18~~, wherein  
said resolver rotor is fixed to a member of a nonmagnetic  
substance; wherein said resolver rotor includes a differential  
circuit type winding; and wherein said actuator further  
comprises a magnetic shield plate made of a magnetic metal  
material disposed between said stator magnetic pole of said  
motor stator and said detetion coil magnetic pole of said  
resolver stator.

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25. A sealed actuator as claimed in one of claims <sup>15</sup>~~16~~ to  
<sup>22</sup>~~23~~, wherein said rotation shaft of said motor rotor is an  
extension shaft fixed to said motor rotor.